

# THE MOTOR AGE

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## FROM THE FOUR WINDS

### AUTOMOBILE CLUB NEWS

New York, April 21.—The big road race gave the membership of the Automobile Club of America quite a boost. There are now fifteen members awaiting election. Most of them are from this vicinity, and among the candidates are several wealthy Long Islanders.

Next Saturday evening, April 28, at the club rooms, Dr. R. H. Thurston, of Cor-

nell University, will lecture on "The Trend of Progress in Automobile Construction." Dr. Thurston will present the conditions that impede and those which favor the permanent and successful establishment of the automobile in the commercial field.

Arrangements have been made by John Brisben Walker for the opening of the clubhouse at Kingsland Point for the convenience of members. A competent

chef will be in charge and all the requirements for the comfort of man and the necessities of his "beast" will be looked after.

#### A STRONG POINT FOR AUTOS

The dealers in automobiles seem to have overlooked a useful point in not advertising more copiously the special adaptability of their machines for Sunday use, says Harper's Weekly. The great objection of the more scrupulous Sabbath keepers to permitting folks to take their carriages out on Sunday has been that it made too much work for servants and horses.

This is a fairly sound objection, for the desire to make Sunday, as far as reasonably possible, a day of rest for all hands, has a great deal to recommend it. But an automobile, especially the sort that the owner himself guides, need make hardly any Sunday work in the stable. At a pinch it can even stand unwashed until Monday morning. Neither coachman nor groom is needed to take it out, or even wait at home until it comes back. It is the ideal Sunday vehicle, beating even the bicycle, since its use is neither so laborious as to impair due Sunday rest nor incompatible with Sunday clothes.

#### WU TING FANG PREFERS YELLOW

Wu Ting Fang, the Chinese Minister, who will go to St. Petersburg in the early summer as the diplomatic representative of his country, will leave the United States in a blaze of glory. He is a devotee of the horseless carriage, and is having built in New York, along lines planned by himself, a gorgeous automobile. It will be of the phaeton type. The body will be painted a brilliant oriental yellow and the velvet upholstery will be of the same hue. It will seat four persons.

Mr. Wu has been spending much time lately learning to manipulate an automobile. At present he hires a machine and takes a spin every morning. He is sanguine of accomplishing great feats in his new chariot, and has already challenged Mme. Hangelmuller, Miss Cassani and Miss Merriam to race with him.

Mr. Wu is mildly surprised that a yellow

vehicle could arouse so much interest. Yellow, he says, is a very quiet color in oriental countries, and, with white, is considered as a half mourning combination.

Mme. Hangelmuller has an automobile of Prussian blue, Senator Depew one of deep red, while Senator Wolcott prefers a jaunty trap of light brown, with black trimmings.

Mr. Wu will take his gaudy equipage to Russia. He says it will be one of the souvenirs of his stay in the western world which he will cherish the most.

#### WHY NOT UNITE?

The New York Sun editorially urges that the League of American Wheelmen and the Automobile Club of America consolidate and form one general association having for its main purpose the improvement of highways.

In urging this course the Sun takes occasion to compliment the L. A. W. on its achievements in the past and gives it credit for being not merely an important factor in the success of the good roads agitation, but for being a living force in the country, exerting its influence in various directions. The Automobile Club, it says, "has set out with a show of ambition which should convince every one that it is prepared to labor industriously and long for the accomplishment of its purpose. Its membership at present contains the names of several men well known throughout the country and seems likely in the near future to include scores of wealthy and influential citizens. The club's scheme for a highway to extend across this continent from Portland, Me., to San Francisco, Cal., with branch roads connecting important places not touched by the main thoroughfare, conveys an idea of the magnitude of its plans." In many respects the aims of the two associations are identical. Each seeks to obtain fair treatment for a vehicle which had no existence when the highway law was formulated and each of which raises new conditions and creates a demand for new or modified laws. The work of placing signboards at dangerous grades and other points interests both, while the touring facilities required by the one are

in many respects such as would be advantageous to the other.

The suggestion of the Sun is one the two associations may well consider. The objects for which each is striving can be the quicker obtained by united effort and a single organization is more effective than two. The L. A. W. has accumulated a considerable store of experience which would be of value to the Automobile Club, and the latter has money and influence.

#### THE PRESIDENT IN AN AUTOMOBILE

Paterson, N. J., April 20.—President McKinley kept his promise to young Garret A. Hobart this morning and went out with him in his electric automobile. Secretary Cortelyou and Mr. Rixey accompanied them. A short visit was made to Cedar Lawn Cemetery, where the remains of late Vice-President Hobart lie.

In the afternoon the president reviewed the cadets of the Paterson military school, of which young Hobart is an enthusiastic member. The rest of the afternoon was spent in a drive to East Side park.

Now if this were only England and the Prince of Wales should have been substituted for Mr. McKinley, the Motor Age would feel called upon to devote several pages to the occurrence, editorially and otherwise, telling what an impetus the industry would receive, et cetera ad nauseum. But this isn't England.—Ed.

#### ARMY AUTOMOBILES

The question of the use of automobiles in the French army is now occupying considerable attention. In connection with this subject, an interesting address was recently delivered at Lyons by Lieutenant Humbert of the 121st Infantry, in which, after passing in review the different systems, electric, petroleum, etc., he showed the advantages and disadvantages of each type for military use and indicated what should be the qualities of a vehicle designed for this service. He shows that the automobile will render an important service in the colonies, in providing for the rapid supply of military

posts and detachments, and describes the system of military automobiles which the government has recently put in action in Senegal.

#### SECOND-HAND POSSIBILITIES

The things that automobiles are expected to do by the none too well informed general public are nothing short of marvelous. The project of a Painesville, Ohio, man appears, however, to have reached the limit of sublime ridiculousness. According to an exchange, A. E. Allen, proprietor of a second-hand store in Painesville, Ohio, is building for himself an automobile in which he expects to make frequent trips to Cleveland and nearby town this spring. Mr. Allen believes \$1,500 an exorbitant price for an automobile and the vehicle on which he is now at work will cost, when completed, not more than \$75.

The various parts have been collected from all over the surrounding counties, and each has at one time or another seen useful service.

The rear wheels were used some fifty years ago in a Quaker mowing machine. They are made of wood and came from a farm back in Cuyahoga county.

The forward wheels were once in a pneumatic racing sulky and are now fitted into the heavy forks of old-time safety bicycles. The 2½-horsepower engine that is to furnish the motive power was built some years ago by a Geneva machinist, and gasoline stove burners ingeniously arranged will generate steam in the boiler which was resurrected from an old building in Painesville.

Mr. Allen believes that the vehicle will prove a valuable advertisement for his business, as it will demonstrate in a practical manner the usefulness of second-hand goods.

#### NEW PROCESS FOR EXTRACTING RUBBER

A new process for extracting india rubber has been brought before the Society of Civil Engineers of France. It was discovered by the French chemist, M. G. Deiss, and allows the collecting of immense reserves of rubber hitherto incapable of being used.

In the actual method of collecting it in-

cisions are made in the trees or lianes are cut. These latter are naturally lost, as well as the trees, if one does not work them in a methodical way, and both contained still a considerable amount of rubber, which was wasted.

Mr. Deiss for several days macerates the bark and the lianes in sulphuric acid at fifty degrees, which decomposes the woody parts without attacking the rubber. The bark is then allowed to drain and, bathed with water, passes between rollers upon which runs a continuous stream of hot water.

The woody portion, reduced to dust, is carried off, and the rubber, absolutely pure after several trips through the rollers, takes the form of sheets between the cylinders. The rinsing water is collected again and evaporated, in order to concentrate the sulphuric acid, which can be used again.

This process, which requires only one of the simplest materials, is very economical.

#### DID NOT HAVE HORSE SENSE

Last Sunday an Indianapolis citizen left his electric vehicle standing at the side of a curb stone in the center of the city. The vehicle aroused the curiosity of a horse which was standing near. The curiosity of the equine rapidly developed into affection and he proceeded to caress the auto. During the course of his love making, his nose came into contact with the controller of the heartless auto, which resented such familiarities by suddenly starting up and knocking the impudent horse down and smashing the wheel of the old fashioned phaeton to which he was attached and incidentally smashing an innocent bystander, in the person of an inoffensive bicycle.

#### A TEST OF ELECTRIC CARRIAGES

A test of electric vehicles will be made in France on April 26 and is to be run over the road from Paris to Dijon, says

an exchange. Manufacturers of French electric automobiles often complain that they are not accorded the same favor which petroleum carriages receive in tests and races. They also complain of the lack of public demand for the electric vehicle, so it has been arranged to give them a chance to create such demand. The object of the trial is to ascertain how far the electric carriage can go without a renewal of energy. Each carriage will have an official aboard to see that the conditions of the test are fulfilled, and the weights of vehicles and accumulators will be registered. It will be a great aid to prospective purchasers to know that 200 to 300 kilograms of accumulator have officially covered such a course.

#### NOW INVADE THE DESERT

The natives in the town of Biskra, situated on an oasis in the Sahara desert, were surprised recently to see an automobile draw up in front of the Royal Hotel. It was their first sight of an automobile. The vehicle was an eight-seated rig, conducted by M. Ernest Archdeacon.

Starting from Batna at 11 o'clock, in a thick snowstorm, he arrived at El Kantara at 1 o'clock, and left again at 2, arriving at Biskra at 4:30 p. m., having covered 121 kilometers.

When he entered the oasis the crowd of curious arabs became so thick that it was with difficulty that he could maneuver his carriage.

Owners of automobiles in Wilmington, Del., are complaining because the turnpike companies charge twenty cents for automobiles, which are rated as traction engines.

A local syndicate is considering plans of putting in lines of automobiles between Trempealeau, Wis., and surrounding towns, which have no railroad facilities.



## JUDGE UPHOLDS AN AUTOMOBILIST

Rochester, N. Y., April 23.—A decision which is of considerable interest, in that it concerns the legal status of the use of automobiles or other horseless carriages in the public streets, was handed down by Judge Sutherland yesterday in the case of Fred Mason and another against Johnathan B. West.

In the opinion, which is published in full below, Judge Sutherland rules that the vehicles in question have a right on the streets, and that the owner or operator is not responsible for damages which may result from fright caused to horses, unless there is contributory negligence.

The decision is on an appeal taken by Mr. West from a judgment of the municipal court for \$42.95 damages and \$10.95 costs. Mr. West is the inventor and owner of a steam vehicle of the horseless variety, and while operating it on Tracy Park, October 18, 1898, a horse belonging to Mason became frightened at the vehicle and ran away, resulting in injury to the horse and damaging the wagon. Reed & Shutt were attorneys for the plaintiffs and Hon. John B. M. Stevens, the present special county judge, appeared for Mr. West. The decision of Judge Sutherland follows:

Plaintiff's horse and delivery wagon were standing on Tracy Park, Rochester, October 18, 1899, the horse being hitched by a strap attached to a thirty-pound weight. The roadway on Tracy Park is fifteen feet from curb to curb. Defendant entered Tracy Park at Alexander Street with his motor-carriage, and as he approached plaintiff's horse, who was headed toward Alexander Street, became frightened at defendant's outfit and ran away, damaging the wagon and harness to the amount of \$17.45. The horse received no injury except as came from fright. The municipal court, in addition to the \$17.45, allowed \$25 damages for deterioration in value of the horse, supposed to follow from the increased propensity of fright induced by its experience on this occasion.

In *Hitchell vs. Rochester Railway Co.*, 151 N. Y. 107, it was held that mere fright caused by negligence does not give to the person frightened any cause of action, no matter how serious the fright may be in its after effects. It is argued with much force that

for the same reasons of public policy which were controlling in the *Hitchell* case, the item of \$25 damages to this horse for fright should have been disallowed. Furthermore, this horse, it seems, had run away twice before, and it would require a very nice insight to determine without speculation or mere guesswork, what effect this scare had upon its permanent psychic equipment.

But, passing that, a more important question is presented, whether any recovery should be had. This motor-carriage was made by defendant, and as described by the witness and shown in the photographic exhibits, while somewhat crude, it does not differ very materially in general appearance from the steam automobiles which are coming into common use. It runs on four wheels with pneumatic tires; has a canopy top and is about the size of a one-horse delivery wagon. The motive power is steam generated by a gasoline burner. A smoke stack connecting with the combustion chamber extends to the top of the canopy in the rear. There are situations in the stack through which the escaping vapor and the exhaust steam passes, and the design is that the exhaust steam shall be condensed inside the stack. This stack would seem to be the main point of dissimilarity in appearance between defendant's machine and other motor-carriages operated by steam.

The horse has no paramount or exclusive right to the road, and the mere fact that a horse takes fright at some vehicle run by new and improved methods, and smashes things, does not give the injured party a cause of action. As Judge Cooley says in *Macomber vs. Nichols*, 12 Mich., 212: "When the highway is not restricted in its dedication to some particular mode of use, it is open to all suitable methods, and it cannot be assumed that these will be the same from age to age, or that the new means of making the way useful must be excluded merely because their introduction may tend to the inconvenience or even to the injury of those who continue to use the road after the same manner as formerly." If the defendant's motor-carriage is practicable for the purpose of travel and the noise and vapor caused by its use are kept within reasonable limitations and are no greater than are fairly incident to the use of motor carriages which are found adapted to the needs of the general public, then I cannot see how the defendant can be held liable in the absence of evidence that at the particular time complained of, the carriage was operated carelessly.

If one should find it desirable to go back to primitive methods and trek along a city street with a four-ox team and wagon of the

prairie schooner variety, it would possibly cause some uneasiness in horses unused to such sights. Yet, it could not be actionable, in my opinion, if a runaway should result, provided due care were shown not unnecessarily to interfere with the use of the highway. Horses may take fright at conveyances that have become obsolete as well as at those which are novel; but this is one of the dangers incident to the driving of horses, and the fact cannot be interposed as a barrier to retrogression or progress in the method of locomotion. Bicycles used to frighten horses but no right of action accrued. (*Holland vs. Bartsch*, 120 Id.; 46 *Thompson vs. Dodge*, 58 Minn., 555.) Electric street cars have caused many runaways. Automobiles operated without steam by storage batteries or by gasoline explosion engines, running at a moderate speed, may cause fright to horses unused to them; yet the horse must get used to them or the driver takes his chances.

The evidence in this case shows that defendant was running his motor at a moderate rate of speed and as it approached the horse he slowed up. Defendant and his wife, who was with him, say they came to a full stop before the horse started to run, but this is contradicted by plaintiff's witnesses who admit he slackened speed.

It will not do to say that it is proper to run any kind of a contrivance upon the street in which persons may be carried. A machine that would go puffing and snorting through the streets, trailing clouds of steam and smoke, might be a nuisance, but this is not such a case. It cannot be said that the defendant's machine is such a departure in its construction or mode of operation from other steam motor-carriages which experience has lately shown to be entirely practicable for street use, as to make it a nuisance, although because of the present novel-

ty of horseless carriages, horses may take fright at its appearance. There was no proof of an unusual amount of vapor escaping at the time of the accident, nor of any amount of noise greater than is ordinarily heard in running a machine of that character, and to sustain this judgment is to condemn the defendant's motor-carriage and all others operating in a similar way, and to declare them impracticable and unfit for use upon the streets.

There is a statute against the use of any vehicle propelled by steam, in public streets (except on railroad tracks) unless a person is sent at least one-eighth of a mile in advance to warn travelers of its approach. (Highway law, sec. 155; Penal Code, sec. 640, sub. 11.) This statute, though broad enough to cover the motor in question, was passed before the automobiles were in use, and it was directed against traction engines, which are ponderous and noisy affairs and have been the cause of much litigation. (*Mullen vs. Glens Falls*, 11 App. Div., 275.) The provision of the law that the forerunner must precede the steam carriage by at least an eighth of a mile, shows that it was not drawn with steam automobiles in mind of the kind used in this case; and if a man had been sent that distance ahead, it would have been of no value to plaintiff as a warning, for their driver would not have met him, so it cannot be said the accident occurred because of defendant's failure to comply with the law referred to.

The temporary inconvenience and dangers incident to the introduction of these modern and practical modes of travel upon the highway must be subordinate to the larger and permanent benefits to the general public resulting from the adoption of the improvements which science and inventive skill have perfected.

The judgment appealed from is reversed.

## GEORGE ISHAM SCOTT'S TRIP

New York, April 22. — George Isham Scott recently returned to New York from a pleasant trip to Washington in his Locomobile, in the interests of the Automobile Club of America, of which he is a prominent member.

He left New York on Wednesday, April 4, with his brother and arrived at Philadelphia the evening of the same day. The next day he went from Philadelphia to Havre de Grace, on the Susquehanna river, choosing a very long and rough

road. The next day he went to Washington, making the total time from New York three days. On the return trip, he drove from Washington to Baltimore, reaching the latter city early in the afternoon, thence to Havre de Grace, thence to Philadelphia via Washington, and from Philadelphia to New York. The trip was made over roads naturally bad, owing to the time of year. The mud, reports Mr. Scott, was often nearly up to the hubs of the vehicle, yet neither in the mud nor

on the steepest grades was he stalled, although he was twice compelled to descend from the vehicle and turn on the steam to dislodge the Locomobile from the holes in the mud. The trip occupied ten days, and during the time the distance covered was 619 miles. While on the return trip, coming across Staten Island, from Tottenville, he beat the train a minute and a quarter in twelve miles,

time of year, and in places he was able to make thirty miles an hour for short distances. The trip was in the nature of an experiment and was designed for the purpose of enabling Mr. Scott to prepare a report for the automobile club as to the best route to be taken between New York and the national capital, condition of the roads, and other details for the information and benefit of the members consti-



GEORGE ISHAM SCOTT IN HIS LOCOMOBILE.

showing that the carriage was none the worse from its long trip under unfavorable conditions.

Washington, D. C., April 21.—Among the interesting personalities in Washington recently was George Isham Scott, of the New York Automobile Club, who came over from the metropolis in a Locomobile. Mr. Scott took three days for the journey, stopping at Philadelphia and Havre de Grace on the way. He found the roads fairly good, considering the

tuting the club of which he is a shining member.

During his stay in this city Mr. Scott was pleasantly entertained by Manager Foster, of the local Locomobile branch, and by other automobilists. The accompanying picture shows Mr. Scott and the vehicle in which he made his trip. It was taken on the ellipse in the rear of the White House. When Mr. Scott left on his return trip he was accompanied to the outskirts of the city by an escort of six Locomobiles.

## WEEKLY PATENT OFFICE BUDGET

AN INVENTION RELATING TO INVENTIONS WHICH SHOULD PROVE OF VALUE TO THOSE WHO LACK MECHANICAL TRAINING BUT WHICH WILL NOT—FEW PATENTS OF VALUE

Letters patent No. 41,144 to D. F. Smith, Suckerville, Ill., assignor by mesne assignments to the Motor Age Company, Chicago, Ill.

This patent is of such exceptional value and clearness that the Motor Age believes it worthy of reproduction in toto, including the drawings and the text, which reads as follows:

*To All Whom it May Concern.*

Be it known that I, D. F. Smith, a citizen of the United States of America and a resident of the town of Suckerville, state of Illinois, have invented a new and useful improvement in the machinery of inventions, of which the following is a specification:

It is a well known fact that the machinery for the production of inventions has hitherto involved a large expenditure of time and money, and that the results are not often satisfactory. It is the object of my invention to provide a new and novel means whereby money can be saved to inventors. In accomplishing the object of my invention, I dispense entirely with the use of expensive and greedy patent attorneys and of annoying and cumulative government fees.

The means whereby the object of my invention is accomplished is set forth with reference to the sheet of drawings which accompanies this specification as a part thereof.

Figure 1 of the drawings is a side elevation, partially in section, of an inventor's head and a drawing board with the various parts thereof. Fig. 2 shows a plan view of a batch of inventions. Fig. 3 is a perspective view of a hand, and Fig. 4 is a side elevation of a waste-paper basket, in perspective.

Like letters refer to like parts in all the figures.

In my improved mechanism A, Fig. 1, is a head of an inventor of any usual or convenient form and B is an idea. From

this idea, B, runs a chain of misguided reasoning, C, to the illogical conclusion, D. It will be seen that when the idea, B, is actuated in the usual manner, it will transmit motion to the chain of misguided reasoning, C, which, in turn, will actuate the illogical conclusion, D. The said illogical conclusion, D, is connected in any convenient manner with the hand M, shown in detail in Fig. 3. To the hand, M, are detachably fastened the T-square, E, the ruling-pen, F, the triangle, G, the bow-pen, H, and the eraser, I.

The motion communicated to the hand, M, by the illogical conclusion, D, is conveyed through the members E, F, G, H and I to the sheet of paper, J, secured to the drawing-board, K, by the thumb-tacks, L, L, L, L, of any convenient construction.

The mechanism, in so far as described, does not differ from the ordinary mechanism in common use and forms no part of my invention, but is described to show with greater clearness the novelty which I have introduced and which I claim as a new article of manufacture.

In Fig. 2 are shown completed inventions, J', J', J', being the sheets of paper, J, Fig. 1, after they have been inscribed by the members E, F, G, H and I.

In Fig. 3 is shown the hand, M, capable of seizing the inventions J', J', J', and crumpling them until they become wads of paper, J''.

In Fig. 4 is shown a waste-paper basket, W, of any known or approved form. The inventions J', J', J' are seized by the hand, M, and converted into wads of paper, J'', and are hurled into the waste-paper basket, W, in the form of discarded inventions, J'', J'', J''.

I desire it to be understood that other means may be used for accomplishing the results attained by my mechanism hereinbefore described, without departing from the spirit thereof, such, for exam-



No. 41,144.

Patented Apr. 21, 1900.

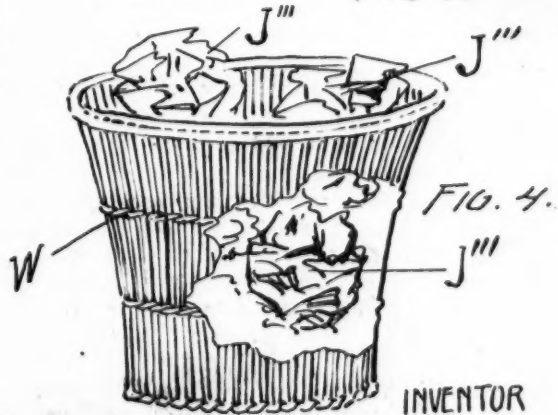
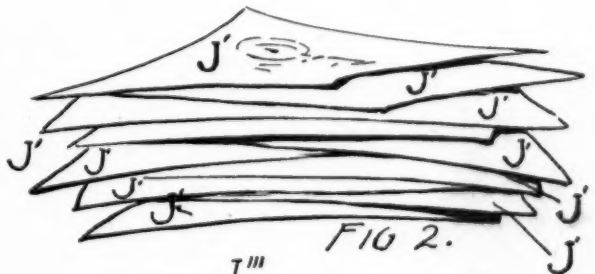
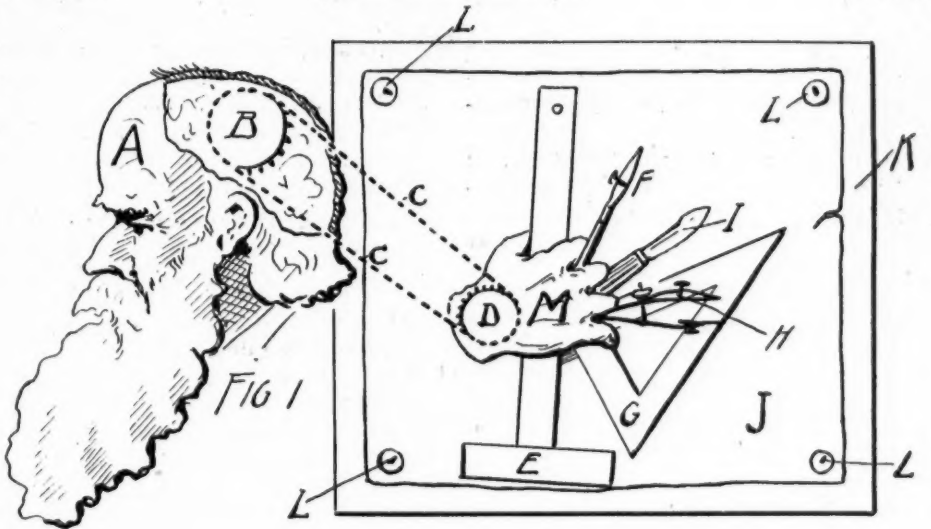
D. F. SMITH.

INVENTION MCEHANISM.

(No Model.)

(Application filed April 21, 1739.)

I Sheet.



ATTEST  
*Toro Furnished of*  
*Confiding Friend*

INVENTOR  
 D. F. Smith  
*Good Grasp & Three*  
 ATTORNEYS

ple, as substituting a cook stove for the waste-paper basket, W, and I hold myself at liberty to adopt such means.

Now, having thus fully described my said improvement, I claim as my invention and desire to patent under this specification:

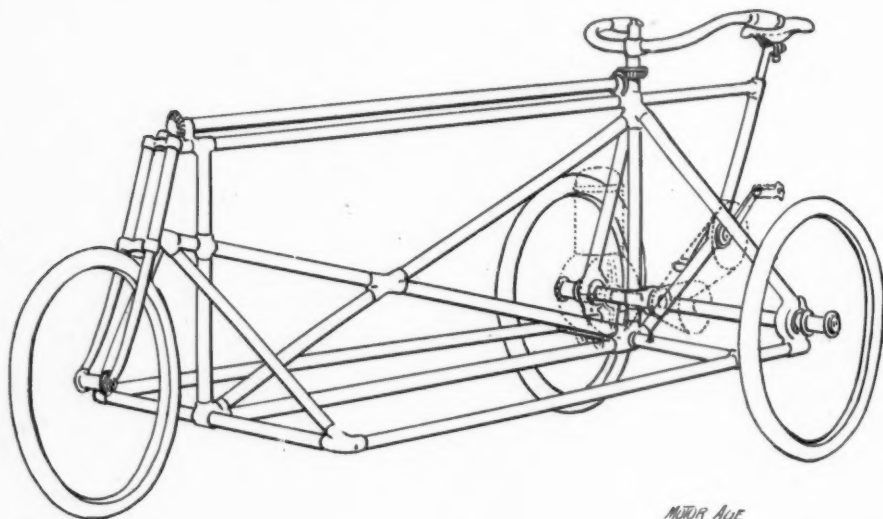
1. In the machinery of inventions, means for dispensing with patent attorneys, government fees, worry and disappointment.
2. In the machinery of inventions, an invention, a waste-paper basket or similar receptacle, and means for connecting

Automobile Patents, as described in the advertising columns of the Motor Age.—Ed.

#### COLUMBIA TRICYCLE FRAME

Letters patent No. 647,505 to Hiram Percy Maxim and Harry M. Pope, Hartford, Conn., assignors by mesne assignments to the Columbia & Electric Vehicle Co. of Jersey City, N. J.

The patentees are employed by the Columbia company at Hartford. The patent refers to a frame evidently designed for a gasoline driven light delivery tricycle. In



*MOTOR AGE*

COLUMBIA CARRIER FRAME.

said invention and said waste-paper basket, or similar receptacle.

3. In the machinery of inventions, a strong hand capable of reducing an invention to a wad of paper, and a waste-paper basket or other suitable receptacle wherein the said wad of paper may perpetually repose.

D. F. SMITH.

Witness:

Fees Furnished.

Confiding Friend.

Mr. Smith might have added to the value of his invention had he included in it the use of a copy of Allen's Digest of

the angles between the central portion of the frame and the low side reaches it is intended, according to the patent specifications, to place boxes or seats—principally the former, no doubt.

Seven claims are allowed, which, however, cover only the particular design shown in the accompanying illustration of the frame, from which the motor and transmission mechanism has been indicated only by dotted lines, for the sake of clearness.

#### BEFORE APPLYING FOR PATENTS

Mechanical men, before applying for

patents on any device applicable to motor-vehicles, will save a world of trouble, and, in many cases, a deal of money, by being provided with a copy of Allen's Digest of Automobile Patents, an exhaustive history of all patents up to July 1, 1899. With the weekly supplements, this digest is kept constantly up to date. For further particulars, see display advertisement.

#### MITCHELL'S FELT TIRE

Letters patent No. 647,989 to Robert J. C. Mitchell, Waterfoot, England.

This invention relates to the use of solid felt, hardened and milled so as to be impervious to water and to combine long life with resiliency and elasticity. Two claims are allowed, of which the first reads as follows:

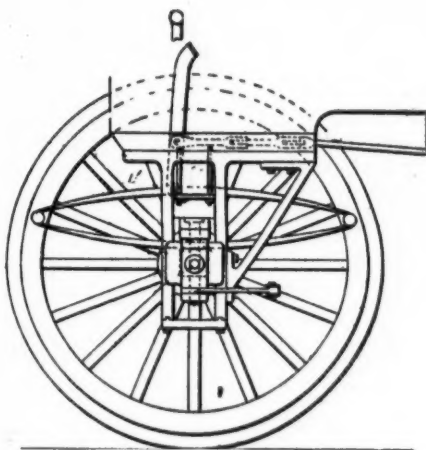
"As a new article of manufacture, a seamless tire of solid felt milled and hardened to the consistency of leather and shaped or turned by a cutting-tool, substantially as described."

#### GIBBS' RUNNING GEAR

Letters patent No. 647,600 to Lucius T. Gibbs, New York City, assignor to Clarence Wainright Wood, same place.

This patent covers a running gear in which there is no direct connection between the two axles of the vehicle. Each end of an axle is provided with a block which has a perpendicular motion in a frame provided for the purpose, which frame is attached to the body of the vehicle, as shown in the accompanying illus-

tration. Either end of either axle may be raised or depressed in reference to the rest of the vehicle without affecting the parts other than the wheel at the adja-



Gibbs' Running Gear.

cent end of the axle. Means are provided for carrying the motor direct on the rear axle.

#### HALLAM'S RIM FOR TIRES

Letters patent No. 647,659 to John Hallam, New York City.

This patent covers by one claim of none too great strength a channel-iron rim for the ordinary solid rubber tire, which rim has corrugations at either side to assist it to surmount car tracks, etc., when the vehicle is crossing them at a slight angle, instead of slipping along the smooth rails and making the vehicle skid.

## CONSTRUCTION OF DIFFERENTIAL GEARS

The differential gear, while a comparatively simple mechanical device, is one that is little understood by the general public, even as to its method of operation. In the mechanical world it is, of course, well understood as to principle, but not so much so in application, for the very good reason that there is little call for its

use—or was, until the introduction of the automobile, in which it is a vital necessity. To be sure, it was used on the old tricycles that were used to a small extent in America and to a considerably greater extent in Great Britain and Europe not many years ago.

In its ordinary form it consists of the

two adjacent ends of a divided shaft, or axle, to which are rigidly attached two bevel-gear wheels of the same size. Meshing with these two gear wheels are one, or two, or more—usually two, set opposite to each other—other bevel gear wheels which are rotatably mounted on pins. These pins are usually fixed to the periphery of a gear-case, or gear-box, which surrounds the entire mechanism, similar to the box shown in the accompanying illustration.

Ordinarily the power is transmitted to the gear-box, by means of a sprocket-wheel or a pinion which is fastened to it. The gear-box, accordingly, revolves and the pins on which are the loosely mounted bevel-gear wheels are carried with it, and these wheels are in turn carried with the pins. The loosely mounted gear wheels, being in mesh with the bevel-gear wheels which are rigidly fixed to the adjacent axle ends, revolve these latter gear wheels and the axles with them.

Normally the loosely mounted gear wheels do not themselves revolve around their axes, but, when there is a greater resistance to one end of the axle than to the other, that end revolves more slowly, and the gear wheel which is keyed to this portion of the axle also travels more slowly. This gear wheel then transmits motion through the loosely mounted gear wheels to the gear wheel on the other end of the axle, where there is the least resistance, and the latter consequently moves faster.

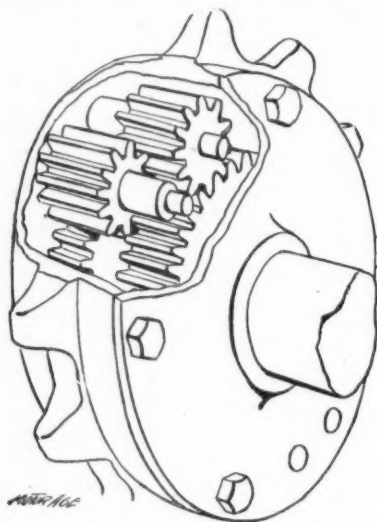
Now, there are objections to this class of differential gear, although not objections of a very serious character. One of the objections is that a greater strain is put on the mechanism in transmission through bevel-gear wheels than through plain pinions; another is that they are more expensive to construct than plain pinions; and a third is that the bevel-gear differential device takes up more room than the one which will be described in what follows and of which an illustration is shown.

The item of resistance in the use of bevel-gears is not a great factor as far as it may be considered as absorbing power, because the transmission of the power in differentiating quantities occurs, in a ve-

hicle, only when the course of the vehicle varies from a straight line, and the differentiation is proportionate to the angle of the curve, up to the point where one of the driven wheels remains in a fixed position. It will take no great amount of thought to show that this occurs during only a very small fraction of the time.

The gear-wheels are, however, subjected to the strain resulting from the use of teeth set at angles, all the time, and, as a consequence, must be more substantially constructed, which adds an item of weight and of consequent size.

A more serious objection than either of those explained, however, is that of size.



The more compact the gearing can be made, the more desirable it is. In any motor-vehicle there is surely enough machinery to be seen, either bare or enclosed in gear cases.

In the differential gear, of which an illustration is shown herewith, the whole mechanism can be made sufficiently strong for use in a vehicle of 1,200 pounds weight and still allow the gear case to come within dimensions of three inches in width by seven in diameter.

The principle involved is similar to that of the gear using bevel-gear wheels. In place, however, of using bevel-gears, plain pinions are substituted. Two pinions of equal pitch are keyed fast to the adjacent ends of the divided axle. Meshing with each of the pinions is one of a



pair of smaller pinions, as clearly shown in the illustration. Each of these pinions meshes with one of the large pinions and also with its small mate.

These small pinions are provided with shafts which are journaled in the two sides of the gear-box, being thus held more rigidly than a bevel wheel which is carried on a pin having only one place of support.

Considering the action of this gear, let it be supposed that the right hand end of the axle shown in the illustration encounters, through its traction wheel, a greater resistance than the left hand end. Then it will tend to retard the rotation of the large pinion keyed to its end. This pinion will, in turn, tend to revolve the small pinion which is in mesh with it. This small pinion will tend to revolve the other small pinion and that, in turn, will tend to accelerate the motion of the large pinion on the end of the left hand portion of the axle. In this manner the two ends of the axle will revolve—in relation to each other—with a speed exactly proportional to their respective resistances.

To further illustrate, let it be supposed that the gear case is held rigidly and that

the two portions of the divided axle are free to move, by having the traction wheels raised from the ground. If the right hand portion of the axle be rotated in a forward direction, the left hand end will revolve in a backward direction. If the matter is not now perfectly clear to the unmechanical reader, it will readily become so if he will trace the movements of the various gear-wheels in the illustration with the point of a pencil.

In reference to the gear-box, the two portions of the axle are either stationary or are revolving in opposite directions. When the vehicle is in motion, the fact that the gear box, itself, is constantly revolving, permits both portions of the axle to have motion in the same direction, although one may have a more rapid motion than the other.

In the differential gear shown in the illustration, there are two pairs of small pinions, one pair being shown where the gear-box is cut away and the ends of the two shafts carrying the other pair being shown journaled in the gear-box. The adoption of a differential gear of this construction is worthy the consideration of manufacturers.

## AUTOMOBILISM IN GERMANY

Berlin, April 10.—The German Automobile Club has 250 members, only seven of whom are ladies. It is the most aristocratic body of its kind in Germany. Duke Victor of Ratibor is president and is assisted in his duties by two vice-presidents, Count Clemens von Schonborn-Wiesentheid and General von Rabe. Her Imperial Highness the Granduchess Anastasia of Mecklenburg-Schwerin graciously accepted the protectorate of the club, and it is to be expected that automobilism will become popular with the ladies of the nobility in a very short time, as so many royal heads have set the fashion to the world at large. The club owns a very handsome suite of rooms in the Sommer Strasse, Berlin, opposite the new house of parliament, and the inauguration of the

club home is expected during the month of May.

Ludwig Lowe, the chief German manufacturer of arms, is reported on very good authority to be about to open a depot in Berlin for his "Lowe" automobiles." His intentions are to build automobiles for war purposes, and he is sure to interest the German emperor in his plans, as His Majesty has been paying this question much attention lately. A relay ride, undertaken by officers of the German army, in the Hartz mountains, met with warm approval from the Emperor, who, on the conclusion of the ride, inspected the autocar that the officers used for their protracted climb.

The German authorities are racking their brains for an equivalent translation

of the word "automobile," but without having come to any satisfactory solution of the problem as yet. The war office has hit upon the word "self-driver" as coming closest to the original, whilst the nomenclature chosen by the police authorities in their regulations has caused no little amusement in the circles chiefly interested. They have dubbed them "power-car," "power-cycle" and "power-vehicle."

A most daring motor theft occurred in Berlin recently, but the offender was luckily almost immediately captured and the owner placed in the possession of his property again. A Berlin engineer was forced to advertise his motor-tricycle for sale, and among those who answered his insertion in person was a bright looking mechanic, who repeated his call and spent some time in having the machine most carefully explained to him. One morning the engineer found the tricycle missing from its shed and promptly alarmed the police, who set the whole neighborhood of Berlin in commotion, with the result that the mechanic was arrested a few miles outside of the city with his new toy. A six-shooter was found on his body, and when conveyed to and safely secured in prison the robber

tried to make away with himself by hanging. He was so determined to end his existence that a special guard had to be placed over him to prevent his premature escape from this world.

A most amusing incident occurred during the Nice automobile week at the start of a corso for automobiles, when the groundmen refused admission to a gentleman about to take his place in the procession, on the plea that his whole get-up looked too poverty-stricken. Nothing abashed and smiling as though being turned away were a grand joke, the gentleman left the track, only to awaken long and loud laughter at the dinner given in the evening, for the "poor" chauffeur was no less a person than Baron Henri de Rothschild.

A German motor-car driver named Bauer, of Cannstatt, who was steering a Daimler car in the late Nice-La Turbie race, died a shocking death soon after the beginning of the competition. On endeavoring to take a corner he ran against the curbstone and was thrown violently, striking his head against a rock, death being nearly instantaneous. His body was conveyed to South Germany for interment. The unfortunate man had entered for the race under the name of "Mercedes."

## THE FIRST MUNGER VEHICLE TIRE

The accompanying illustration is an exact photographic reproduction, both as to appearance and size, of the first section of the first complete Munger tire, made in the manner in which this tire will, in future, be made for the market. A complete technical description of the tire was given in the Motor Age in its issue of December 14, 1899, following the issuance of the patents covering it. The inventions were taken up by people interested in the Rubber Goods Co.—the rubber trust—and the Munger Vehicle Tire Co. was formed.

Since that time experiments have been carried on to determine the best method

of manufacture. In a personal letter to one of the Motor Age staff, a member of the Munger company writes:

"Most of our experiments, thus far, have been with compounds and cures, which we have now mastered and are now ready to go after business. Our first complete tire, under the new process, was completed today (April 9), and I am sending you the first section cut from it, that you may judge with what success we have met.

"The tests have far exceeded our most sanguine expectations and have proven, beyond the shadow of a doubt, that the tire is not only a mechanical possibility,

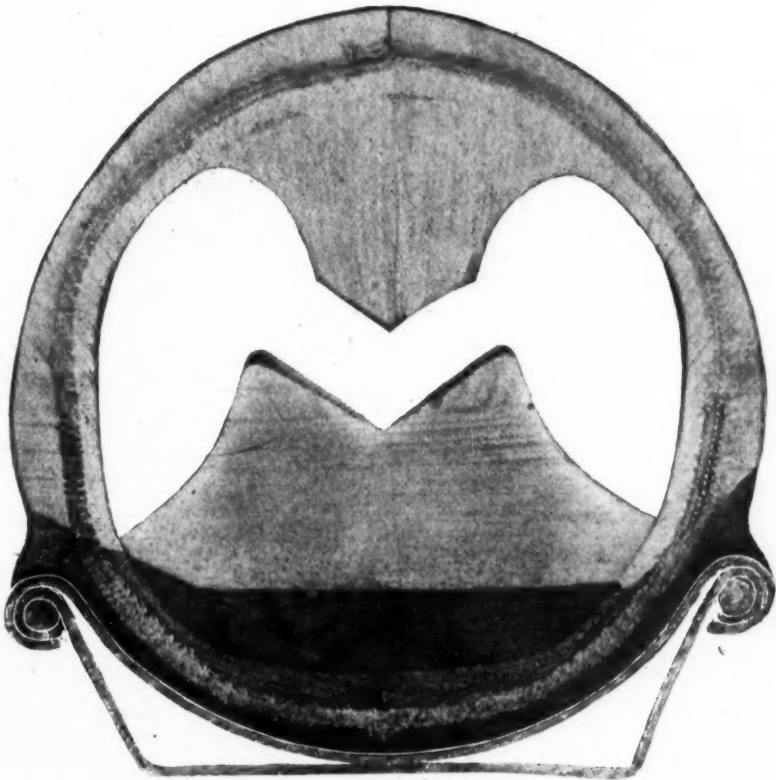
but can be made, under our patented process, with more uniformity than is possible under any other method. There is positively an equality in the strains on all parts of the tire and there is no compression of the stock in the inner, or rim, periphery, as is the case in all tires built up on straight mandrils and in which the unequal strain assists materially to weaken and lessen the life of the tire.

"Our tests, thus far, have proven our

cure them to the rims, by the introduction of a very simple device.

"Our experiments have proven that the tire can be manufactured precisely as designed, notwithstanding all the statements to the contrary by those who were supposed to know the rubber business."

The lower portions of the tire which show dark in the photographic reproduction appear so from the effects left by the



FIRST MUNGER VEHICLE TIRE.

tire to possess so much merit that we are, in view of the many inquiries we have had, making preparations to cater to the lighter vehicle trade, for light runabouts, etc.

"We will also be able to take care of the demands for tires for wire wheels, and we believe we can overcome all the trouble hitherto experienced with motorcycle tires, caused by the inability to se-

hack-saw with which the rim, to which is vulcanized the tire, was sawed. The three layers of canvas can be seen in the illustration. This canvas is surrounded by pure rubber of great elasticity, with which the buffer opposite to the rim is integral, making this wedge-shaped buffer therefore very elastic. The under buffer, near the rim, is, on the other hand, so hard that a finger nail can scarcely make an

impression in it. The lips of rubber which are vulcanized to those portions of the rim which is rolled over the wires resist all attempts to pull them loose

from the rim, and, naturally, the portion of the tire that is seated in the concave portion of the rim can not come loose until the lips do so.

## TO AND FROM EDITOR AND READER

### FUNCTION OF THIS DEPARTMENT

To make clear the function of this department of the Motor Age which has become a fixture, under the above caption, the editor begs to state that all subscribers of the paper are at full liberty to take advantage of it to ask any and all questions pertinent to the scope of the paper, which questions he will answer to the best of his ability, either in print or by personal letter—the former when the questions are of such a character that they and their answers may prove interesting to the general reader, and the latter when such is not the case.

Communications of a character generally interesting are also welcome.

Correspondents are requested, however, to make their communications as short and to the point as possible. It is not necessary for them to eulogize the Motor Age or to flatter the editor in order to secure answers to questions or the publication of interesting letters. The well known modesty of the editor would prohibit the publication of such parts of the letters, in any event.

To receive attention correspondents must sign their names and addresses, which, however, will be omitted from published letters, if the correspondent so requests. It is the editor's desire, however, to make this a department in which readers of the Motor Age will feel glad to come before the motor-vehicle public without concealment.

The editor will be grateful for the correction of any mistakes that may creep in, as well as for suggestions from readers, whether pertinent to this department or other portions of the paper.—Ed.

### VARIATIONS IN SPELLING

Editor The Motor Age.

The adoption of many of the names for

self-propelled carriages has not only caused comment and discussion from all classes of people as to the proper one to adopt, but it has found many an amusing incident in connection with the pronunciation and proper spelling of the names suggested.

During the past week in our factory, where we devote certain parts of the factory to another class of work, a certain workman was shifted to the automobile department. At the end of the day, when he was given his time slip to fill out, he was instructed to insert that the time designated on slip was on automobile work. He acknowledged he did not know how to spell that word, so the foreman instructed him to put it horseless carriage; he did this, and when his slip came to the office the name appeared with ten hours' work on "horsel carige." The next day his slip read "horsles carage" and the third day he apparently decided to get out of terming it "horsel carige" and so he inserted the term "otomobeal." —Chester I. Campbell, Connellsville, Pa.

### PERCENTAGES OF EXPLOSIVE MIXTURE

Editor The Motor Age.

In what way are the mixing percentages of gasoline and air for a gas engine cylinder determined?—Experimenter, Boston, Mass.

By experimenting. On the grade of gasoline depends the amount that can be absorbed by a given quantity of air. On the temperature of the gasoline and the air and the mechanism of the carbureter depends the amount it will absorb. On the richness of this gasoline vapor depends the amount of fresh air that must be mixed with it to produce a perfect explosive mixture. The proportion, under favorable circumstances, should be about



six parts of air to one of gasoline vapor.—Ed.

### WANTS A MOTOCYCLE

Editor The Motor Age.

I am contemplating buying a motorcycle and would be glad if you would tell me what would be best for a prairie country besides the electric cycle.—(Dr.) J. De Mott Guthrie, Luverne, Minn.

There are no electric cycles. The Waltham Mfg. Co. of Waltham, Mass., can furnish you the best gasoline driven tricycle or quadricycle. Write them for catalogue.—Ed.

### WANTS PATENT INFORMATION

Editor The Motor Age.

Is there any United States patent covering broadly the use of a drive shaft differential gear with sprocket attached annularly to casing? If so, can you give me the date and number?—L. E. Langworthy, Indianapolis, Ind.

Probably not. The device is largely used by different makers. Refer to Allen's Digest of Automobile Patents, of which an advertisement appears in this issue of the Motor Age.—Ed.

### ABOUT GASOLINE OMNIBUSES

Editor The Motor Age.

Have any of the large explosion-engine motor-vehicles built in this country for such purposes as 'bus service proven practical in competition with other forms of similar transportation?—E. R. E., Chicago.

The editor knows of no case in which gasoline omnibuses have been used in competition with horse-drawn vehicles long enough to furnish a fair basis of comparison. Possibly some reader of this question can throw light on the subject.—Ed.

### CONCERNING BACK FIRING

Editor The Motor Age.

In a gasoline engine fitted with carbureter which keeps the liquid at a certain level by means of a float and valve, how does the opening to suction pipe stand, relative to that level? Does gasoline flow

by gravity from such opening, or is it sucked out by syphoning action of air in pipe? Finally, and most important, is there any possibility, in case of admission valve sticking open, or otherwise, of fire following back, and causing explosion in suction pipe, or possibly in carburetor itself? I want to know whether it is safe to run such a motor without wire gauze protection near admission valve, to prevent such running back of fire.—Ignorance.

The valve-and-float mechanism, in carbureters embodying such mechanism, is used for maintaining a constant level in what may be called an auxiliary supply tank. From this tank the gasoline flows by gravity into the carburetor proper, where it is maintained at the same level and whence it is drawn by suction in the form of atomized fluid, which is immediately converted into vapor by the introduction of hot air. The opening to the suction pipe is always higher than the level of the liquid. There could be no "siphoning" unless the opening were lower than the level of the liquid.

A series of sheets of wire gauze are commonly interposed between the point where the hot air enters and the point where the resultant vapor is mixed with the unheated air, for the purpose of thoroughly impregnating the hot air with gasoline. There is usually another series of wire gauze sheets interposed between the point where the unheated air enters and the admission valve to the engine, again for the purpose of mixing, to produce a homogeneous explosive compound. These two series of gauze sheets also serve the purpose of preventing back-firing, which is a very serious consideration.

It may be possible to construct a carbureter in which the use of wire gauze is not normally necessary, but if Mr. Ignorance has no premature desires to investigate the glories of Kingdom Come, the Motor Age would advise him to use the wire gauze. If it does no good, what harm can it do?

A description of a carbureter embodying the valve-and-float mechanism was described in the Motor Age of April 5, 1900.—Ed.

## WRIDGWAY WINS THE CONTEST

DEFEATS SKINNER IN A CONTEST IN WHICH THE AMERICAN LED FOR THE FIRST TEN MILES WHEN HIS MOTOR WENT WRONG

Philadelphia, April 24.—Despite the prevalence of a brisk drizzle throughout its continuance, the hour's motor tricycle race between Charles G. Wridgway, of London, and Kenneth Skinner, of Boston, was pulled off at the Woodside Park track, and the Britisher won, notwithstanding the fact that Skinner demonstrated that his machine was the faster of the two, when everything went well. There was but a corporal's guard of the faithful present; indeed, there was little effort to advertise the affair, the contestants being refreshingly indifferent to the smallness of the gate, the \$300 bet and the honor of winning being apparently sufficient incentive to them to go on with the contest under the discouraging conditions.

### Not a Success as a Race

As a race the contest was not a success; as a demonstration of the ability of the machine to do forty or more miles an hour, all out, it was all that could be desired. Wridgway was not pushed after the tenth mile, and he merely kept his long lead (gained by the Bostonian's motor going wrong) without endeavoring to add to it—and even at that he easily covered thirty-eight miles and one lap within the hour.

Wridgway's machine is of English make, of 2 1-2 horsepower and much lighter than that of his opponent, which is of French construction and made proportionately heavy in order to safely carry its four-horsepower motor.

### Start of the Contest

After one false start, due to the Englishman's gasoline tank being overloaded, the two got away at 3:10 to a flying start. The Englishman led at the end of the first mile, which was covered in 1:36. Before the second mile-post was reached, however, Skinner took the lead, and then began to demonstrate that his "choo-choo" could go. "Slowly but

rapidly," as the Irishman said, the Bostonian began to draw away from the Briton, despite the latter's exertions, and at the sixth mile came up behind him and shot past—a lap to the good.

### Skinner Has an Accident

Apparently content with this advantage, Skinner kept his antagonist company until shortly after the tenth mile was registered, when it was noticed that his machine began to slow down. Something was wrong, and the Bostonian, perforce, was compelled to devote about four minutes' time to remedying the defect; but by the time he got going again Wridgway was a trifle over three miles in the lead and looking very comfortable.

Skinner couldn't pick up an inch on the Englishman, but neither could the latter on him, until on the twenty-fifth mile the Bostonian's mount began to buck again, when Wridgway took advantage of his preoccupation by stealing another lap. On the twenty-ninth mile Skinner was put out of business for keeps by the blowing out of a valve on his machine, and from that time on Wridgway took in a couple of reefs and jogged along for the rest of the hour to the tune of "I'm Livin' Easy."

### Timing at Fault

The timing was a little on the saffron order, the intermediate times being so palpably incorrect that but one or two of the Sunday papers published them. The times for each five miles are appended, however, as, by comparison with outsiders' watches, they have been proved to be approximately correct:

| Miles. | Leader.        | Time.     |
|--------|----------------|-----------|
| 5      | ..... Skinner  | 8:01 3-5  |
| 10     | ..... Skinner  | 15:55     |
| 15     | ..... Wridgway | 23:18     |
| 20     | ..... Wridgway | 31:20     |
| 25     | ..... Wridgway | 38:01 4-5 |
| 30     | ..... Wridgway | 46:15     |
| 35     | ..... Wridgway | 54:53 2-5 |
| 38 1-3 | ..... Wridgway | 60:00     |

After the match Skinner expressed a

desire to try conclusions again with the Englishman, under the same conditions, before his departure next Saturday for the other side. Wridgway, however, refused to state positively whether or not he would accept the challenge, but intimating to the newspaper men present that he might possibly accommodate the

Bostonian some afternoon during the coming week.

—  
This race establishes an American one-hour record for motorcycles. The English record is approximately forty-one miles and the French record forty-three miles in the hour.—Ed.

## NEWS OF THE MOTOR INDUSTRY

### DIAMOND MOTOR-VEHICLE TIRES

During a recent trip among automobile manufacturers a representative of the Motor Age observed that a very large proportion of the builders were using Diamond tires, made by the Diamond Rubber Co. of Akron, O. In answer to his inquiries, the makers were almost unanimous in saying that the tires were entirely satisfactory, and, in cases where such was not the verdict, failure could readily be traced to the use of tires of too small diameter for the weight which they were called upon to carry.

In this connection a portion of what the Diamond company say in their catalogue is of interest. Speaking of their motor-vehicle tires, they say:

"We know of no product that is making history any faster than pneumatic automobile tires. We settled our standards of weights and quality a year ago. It could only be settled after an actual experience of three years. We know of one consumer who demanded light weight tires made to his ideas. We declined to make them and have just learned that he has had troubles and is loaded up with a stock of no value to him. He has increased the weight of his tires thirty percent, which brings them up to our standard. The whole question is a combination of material and mathematics."

The Diamond company, in listing its different sizes of tires, states the size that is suitable for each weight of vehicle, a feature that will be welcomed by makers and users of motor-vehicles, and which other manufacturers of tires would do well to follow.

Under the heading, "Care of Automobile Tires," the company has the following to say:

"See that tires are cemented to the rims as well as fastened by lugs. Shellac is preferable. Be sure your metal rims are flared at edges and never ride tires without fully inflating at about 100 pounds pressure. Every owner should possess a large pump equipped with a pressure gauge.

"Leaky tires should be attended to promptly. Avoid large stones or obstructions, because a sharp blow ruptures the fabric and the tire is to all appearances like a porous tire. A careful manufacturer never delivers a porous tire, because careful inspection will discover it before delivery."

The company furnishes motor-vehicle tires for twenty-eight, thirty, thirty-two, thirty-four and thirty-six-inch wheels, in diameters of two-and-one-half, three, four and five inches, according to weight to be carried, and, in addition, furnishes crescent steel rims with flared edges for these tires.

Repairs of all kinds of Diamond tires are made at the factory or at a Diamond repair station, one of which is located at 215 West Fifty-third Street, New York City, and another at 7½ Appleton Street, Boston.

### AN ASTER MOTOR DEPOT

The Waltham Mfg. Co. of Waltham, Mass., write the Motor Age as follows:

"As you are doubtless aware, we have the exclusive American agency for the Aster motor made by the Aster Motor Co.

of St. Denis, France, and, in addition to using them on our own tandems, tricycles and Autogós, we will offer them for sale to the general public. In order to better handle the department we are going to open a "motor accessory department" at 424 Massachusetts Avenue, Cambridge, which will be installed with a complete line of Aster motors, carbureters, batteries, etc. We will also handle a complete line of all kinds of motor accessories, which we will sell at both wholesale and retail.

"The Aster line will include air cooling motors for tandems, tricycles and Autogós, and water cooling motors for voiturées, runabouts and light carriages. We will also have samples of all kinds of vehicles fitted with the motors. Albert Champion will be on hand to demonstrate them to prospective purchasers of either tricycles or complete carriages. While we will, of course, sell the complete vehicles from this department to anyone wishing them, the important business will be the sale of motors and accessories. We expect to have the department in operation by May 1."

As the Aster motor is of comparatively recent origin, it appears pertinent to state something about the position that it has already achieved in the land of its birth—France. This can best be done by quoting from "Le Revue de l'Industrie Nationale," which has the following to say:

The Aster motor is of recent creation, viz., October, 1899, but it has already brilliantly assumed first place.

In the race from Paris to Mantes and back, organized by "La Presse" it showed its indisputable superiority. In this race of 100 kilometers, over somewhat uneven country and in a drenching rain, Beconnals was first on a tricycle, with "Avant-train" carrying two persons, in two hours and forty-four minutes, beating the best of his competitors by twenty-one minutes. The machine was furnished with the Aster motor.

The Aster motor has been specially designed for speed and touring tricycles, and also for two seated quadricycles.

The effective horse-power of the Aster motor is 2.1-4 at 2,000 revolutions. It is built by the Aster company in their plant, 33 Boulevard Carnot, St. Denis, Paris.

The official representative of "La Revue de l'Industrie" upon due investigation of the motor, states its plain advantages to be as follows:

First.—The facility of cooling off, due to its radiating flanges of corrugated copper, a

metal the conductivity of which, being superior to that of cast-iron, secures on an equal surface thrice as great cooling as the latter. While it is possible with copper to enlarge the surface (which is not possible with cast-iron) the heat produced by the internal explosions of the motor is in every case completely absorbed, affording the motor constant power and regularity, whether after a few minutes or several hours of fast riding, maintaining thereby perfect lubrication.

Second.—Another great advantage of the Aster is its constancy of carburation. The gas, accumulating in a dome surmounting the carburator, stays there a sufficient time to cause a perfectly homogeneous mixture of air and hydrocarbon.

The electric ignition is so arranged as to change the time of ignition, the form of the cam assuring a perfect contact and the interruption of the current producing the spark.

Now, as to the most successful achievement of the Aster motor besides the Paris-Mantes contest mentioned above, here are the principal records made in 1899 by the Aster, which constitute the best proof of its practicability:

Kilometer record; Rigal, 57 3-5 seconds.

Nice-Castellane-Nice; Rigal finished first of the motorcycles without a double motor.

100-kilometer course (Nice); Beconnals finished first.

Paris to Roubaix, (269 kilometers); Beconnals finished second.

Dresden to Berlin, (218 kilometers); Krauss finished first.

Race of motorcycles and voiturées to the Park of Princes (twenty kilometers), won by Vasseur in 21 minutes; Beconnals finished second.

Pau to Bayonne (104 kilometers), Rigal finished first in 1 hour 58 minutes.

Pau-Bayonne-Pau (208 kilometers), Vasseau 1st, Beconnals 2nd.

Grand race for Amateurs U. S. F. C. A. for cup, Maron to Gardon (100 kilometers), Madec first, Tamplier second, Richard third.

Motocycle cup of the Automobile Club of France (100 kilometers), Beconnals first in 1 hour 46 minutes (record).

Gold cycle race at Berlin, Heiman first, Demester second (Motor-Gladistor).

One-hour race to Park of Princes (in the rain), Beconnals first (57 kilometers 453 meters), Rigal second.

London race (twenty miles), Wridgway first.

Challenge race for motorcycles at Little, Richard first, Bayonne (20-kilometer course), Bertin first.

Paris to Brest and return (1,200 kilometers), record established by Charles Terront in 40 hours 4 minutes.

#### LOCOMOBILE CO.'S AGENCIES

New York, April 21.—In addition to extending its branch and exclusive agency



system to leading centers, the Locomobile Co. of America has established several branch stores and storage stations in this city. On the southwest corner of Seventy-sixth Street and the Boulevard it has a six-story building with storage facilities for 400 vehicles. Here owners' locomobiles are stored, cleaned and repaired. It has also established at 97 Greenwich Street a storage station, where owners riding down to business may leave their vehicles. In the Empire Building the company has a booth, where they have taken orders for at least thirty locos each month. Nearby suburban trade in New Jersey is cared for at its branch at 8 Central Avenue, Newark, N. J.

The company has a branch and storage station in Washington, D. C. Exclusive agencies, with storage and repair facilities, have been given to the Rochester Automobile Co. at Rochester, N. Y.; to the National Cycle & Automobile Co. at Montreal and Toronto; to C. Henry Squires at Plainfield, N. J., and to C. Arthur Benjamin, who has formed the Syracuse Automobile Co.

#### THE INDUSTRY PROGRESSING AT KOKOMO

The Haynes-Apperson company of Kokomo, Ind., have let the contract for a substantial addition, 40 by 100 feet and two stories high, to their plant at that city, necessitated by the rush of orders. The company will have an exhibit at the Paris exposition, which will be in charge of Lacy Potter, who left the factory some time ago for the French capital.

Among the recent sales of the company is, that of a vehicle to the British Lord Russell, who will take the American auto to England with him, to which place he is en route from the west.

#### MOTOR-VEHICLES FOR HAWAII

The inhabitants of the Hawaiian Islands evidently have determined to keep pace with their fellow citizens in the United States, for within ten days \$50,000 worth of automobiles have been shipped to them. The Woods Motor Vehicle Co. built the vehicles, which included large cabs, small cabs, delivery wagons, and "T" carts, each accompanied by an ex-

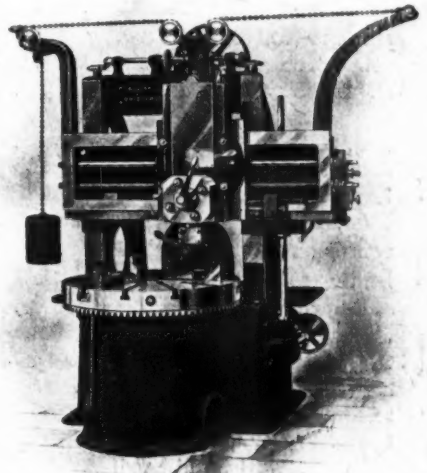
haustive treatise on the art of guiding and managing an automobile.

#### BULLARD BORING MILLS

The present is an age of special machinery. Without such machinery the manufacturer of today is apt to be the bankrupt of tomorrow.

Among the machines particularly adapted to the needs of automobile manufacturers are the Bullard boring mills, marketed by the Marshall & Huschart Machinery Co., of Chicago, Cleveland and Cincinnati.

The advantages of a machine of this



type on work heretofore done on the face plate of a lathe are so numerous as to warrant investigation by every prudent manufacturer.

The machines are built in several styles to suit the work for which they may be required. They are specially desirable on cylinder work for gas or steam engines and for boring and finishing fields for electric motors, as well as for work on a general line of cast iron and steel.

These machines are in use in quantities in the largest electric engine and gas engine works in the country.

#### BEFORE APPLYING FOR PATENTS

Mechanical men, before applying for patents on any device applicable to

motor-vehicles, will save a world of trouble, and, in many cases, a deal of money, by being provided with a copy of Allen's Digest of Automobile Patents, an exhaustive history of all patents up to July 1, 1899. With the weekly supplements, this digest is kept constantly up to date. For further particulars, see display advertisement.

#### A NEW ROCHESTER CONCERN

The Empire State Automobile Co. of Rochester is about to file articles of incorporation with the secretary of state, to engage in the business of manufacturing and selling motors, automobiles and vehicles of every description. Its capital stock is \$20,000, and the directors for the first year are Martin E. Pinckney, George E. McElroy and Albert L. Cole. The company will purchase the buildings at Nos. 22-26 Cortland street, and intends to start the wheels of the automobile factory at once.

Mr. McElroy is a skilled mechanic, inventor and patentee of Elmira. He will be the foreman of the mechanical part of the works. Some of the machinery has already been placed in the building and the work of manufacturing and perfecting gasoline and electric motor carriages begun. The four stories of the building at No. 20 Cortland street and the adjoining stores will be utilized. It is not expected, however, that any of the vehicles will be put on the market before May 1.

It is understood that the two men who have engineered the project are C. B. Townsend and Herbert Clark. They are very sanguine of the success of the venture, and hope soon to supply the city with a horseless carriage at a reasonable price.

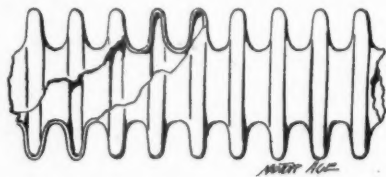
#### DEMAND FOR QUADRICYCLES

New York, April 21.—The demand for quadricycles keeps up and every effort is being made to turn them out in sufficient quantities to satisfy the demand. At Iven, Brandenburg & Co.'s New York headquarters the sale and delivery to one concern making a specialty of this class of vehicles of 400 sets of parts was reported. The original order was for 200 sets and the second order duplicated the

first, showing that the original lot had been used up.

#### FRENCH WATER COOLING TUBE *with hollow corrugations*

The accompanying illustration shows a view, partially in section, of a water cooling tube for gasoline motors that is being used extensively in France in the place of the tubes on which thin fins of aluminum or other metal are shrunk. As will be seen by a glance at the illustration, this tube is made with hollow



corrugations. Being very thin, it allows the water to present a very considerable surface of contact to the very thin copper tubing, which latter is subject to the cooling effect of the rush of air when the vehicle is in motion. This tube, "with hollow wings," as it is expressed in the French idiom, is marketed by the Company Francais des Metaux of Paris.

#### HOW TO SAVE MONEY

Many a man has wasted time and money in perfecting devices that have already been perfected, only to learn, when applying for a patent, that he has been anticipated. This can be avoided, as far as motor-vehicles are concerned, by having a copy of Allen's Digest of Automobile Patents. See display advertisement on another page.

#### DEMAND FOR VEHICLES IN RUSSIA

Consul General Holloway writes from St. Petersburg that the Russian minister of war is desirous of purchasing a freight automobile, to be propelled by either steam or kerosene, and proposes that if any manufacturer will ship two such carriages, one for steam and the other for kerosene, to St. Petersburg, the war department will pay the freight and duty on both, purchase the one best suited for its purpose, and return the other. The machines are to be in St. Petersburg by June, 1900. Manufacturers will please

send catalogues, giving weight, inside dimensions, price, rapidity of movement, and other data, to Colonel N. A. Blinoff, chief staff, ministry of war, St. Petersburg, Russia. Mr. Holloway suggests that the possibility for large orders to supply the Russian army, which is scattered over an area more than twice the size of the United States, with automobile wagons, is worthy of attention.

#### A NEW FACTOR IN THE INDUSTRY

The New York & Ohio Co. of Warren, O., large manufacturers of electrical goods, have been experimenting on gasoline motor-vehicles for the past year. They write that their experimenting is at an end and that they now have commenced regular deliveries, starting with a capacity of two carriages a week, which capacity will be rapidly increased. Numerous patents, covering all details, have been applied for by Messrs. Packard and Hatcher, the inventors. A complete illustrated description of the vehicle will appear in the Motor Age in the near future.

#### HERTEL MOTOR IMPROVEMENTS

New York, April 21.—It was learned today by a Motor Age man that great improvements have been made in the Hertel motors, which are used on the Oakman motor-vehicles. It is said that the power has been increased fully twenty percent

and that a brake test showed an increase of from twenty-three to twenty-seven percent. It is further reported that noise has been entirely eliminated.

#### ENLARGING COLUMBIA FACTORY

The Columbia and Electric Vehicle Co. is breaking ground for a new factory building at Hartford, Conn. It already occupies the old Pope electric vehicle plant, which has already been enlarged, as well as the Hartford Cycle Works factory.

#### THE SLAYMAKER-BARRY CARRIAGES

Matters are progressing favorably in the automobile department of the Slaymaker-Barry Co.'s factory at Connellsville, Pa. In a short time it is expected that carriages will be turned out in satisfactory quantities.

The Automobile Supply Co. of St. Louis writes that the capital stock of the company has been increased in order to be able to supply running gears and supplies promptly, which they can now do. Tires, rims, wire and wood wheels, batteries, etc., are carried in stock.

The St. Louis Electric Automobile Co. has been incorporated, with James A. Graham as president; F. E. Bush, secretary, and A. L. Dyke as superintendent.

## MOTOR RACING AND MOTOR PACING

#### PROPOSED RACES AT ATLANTA

It is proposed to have a number of motor-vehicle races at the Southern Inter State Fair that will be held at Atlanta, Ga., the coming fall. The scheme was proposed by Albert Howell, who has been put in charge of the project.

In speaking of the matter, Mr. Howell is quoted as saying:

"My idea is to make a big feature of the initial race on opening day, having

the machines start at the grounds, run out to Fort McPherson, return and finish at the park. Such a race would attract more attention than anything I know of and would cause general interest in the events to be given afterward.

"On each succeeding day one race would be made a special feature.

"There are dozens of different makes of machines on the market, and I am satisfied that all the American manufacturers would be glad to make exhibits. Auto-

mobiles are practically unknown in the south and the manufacturers would realize that this would mean their introduction to a new territory."

### RACES AT PARIS EXPOSITION

The United States Commission of the Paris Exposition states the following, through its press agent, concerning the automobile races to be held during the summer:

The special committee that will have charge of the racing contests comprises some of the leading men of France. The chairman of the committee of consultation is M. Forestier, inspector-general of bridges and highways; the vice-presidents are: Count De Dion, of the Automobile Club of France; Morris Binder, member of the French chamber; Eugene Sartaland, member of the committee of the congress of automobile locomotion. The committee of the Automobile Club of France will have immediate charge of the organization of the contest. The place of arrival and departure of all the races will be, so far as possible, the Bois de Vincennes, in the neighborhood of the Lake of Dumesnil. The rules governing the races will be those of the Automobile Club of France, to which organization all entries should be addressed at the headquarters, Palace de la Concorde, Paris.

In all likelihood the first competition will be for automobile touring carriages, and will be during May. In this contest there will be four classes, namely: Carriages for two persons, weighing more than 400 kilograms; carriages for four persons, weighing more than 400 kilograms; carriages for six persons, weighing more than 400 kilograms; carriages for more than six persons. The various carriages will make five runs of 150 kilometers each. They will leave Vincennes, and a course will be laid out in such a way as to cover fifty kilometers in the morning, departure and return to Vincennes, and 100 kilometers in the afternoon. The contest will be decided by the amount of fuel or motive power consumed, by the action of the motor, by the comfort of the carriage and by the ease of control. The speed shall not exceed twenty kilometers in populated districts and thirty kilometers in the open road. The prizes will be objects of art of considerable value.

Much interest attaches in commercial circles principally to the contest between delivery wagons and cabs. This will take place in June. The programme will include a contest of automobile cabs and delivery wagons, capable of carrying a load of 1,200 kilograms in weight. The trials will be repeated five times in one week—from Monday to Saturday, Thursday excepted.

Probably the most interest centers in the contest of speed, which is set for July. In

this will be shown the finest types of automobiles that have ever been brought together. The competition will be for all vehicles, according to the classification given in the rules of the Automobile Club of France for last year. It will take place under special provisions yet to be made. The vehicles will be run during one week, Thursday excepted. There will be five heats, of 300 to 400 kilometers each, starting and finishing at the Point de Joinville. The carriages will start out in trial from the grounds of Vincennes to the Point de Joinville, from which point the departures will be timed. On the finish carriages will be timed at the Point de Joinville and from there will pass to the track of Lake Dumesnil of which they will make two circuits. Semaphores will be established at the track and will announce the arrival of the carriages. There will be nine cash prizes, aggregating 30,000 francs. The first will be 8,000 francs. In the contest between small carriages there will be seven prizes, aggregating 9,000 francs, the first prize being 4,000 francs. In the race between motorcycles there will be thirteen cash prizes, aggregating 8,000 francs, the first prize being 2,000 francs and the second 1,500 francs. The contest between small carriages, or voiturettes, as they are called in France, will take place during August and will be between vehicles weighing no more than 400 kilograms. These should be adapted to two persons, either side by side or in tandem. The program will be the same as that for the touring carriages.

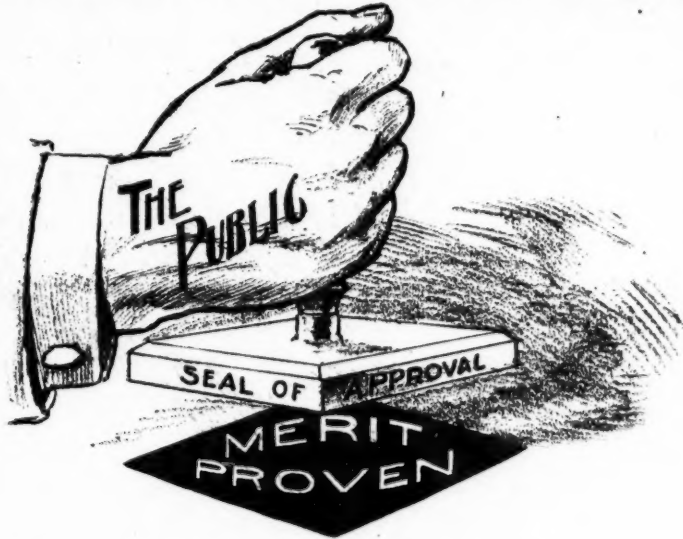
The contest between lightweight automobiles will take place in September. These are called *petitpoids*, for carrying merchandise with a normal load of 100 kilograms. The contest between heavyweight automobiles will take place in October. There will be three classes, namely, vehicles for carrying passengers in numbers, vehicles for transportation of merchandise above one ton in weight, and delivery wagons capable of transporting 1,250 kilograms. These vehicles shall run each day during one week one heat of 50 kilometers. The course will be so laid out that the vehicles will return to Vincennes in the middle of the run. The first part of the course will be covered in the morning and the balance in the afternoon.

United States Commissioner-General Peck has taken great interest in this automobile contest and will offer every facility for American visitors who desire to witness them. The program as above outlined has been approved by the Commissioner-General of the Exposition Alfred Picard.

### BAN ON AUTOMOBILE RACES

The action of the prefect of Seine et Oise, one of the biggest departments of France, in forbidding automobile races, is causing no end of comment and difference of opinion here, says a cable dispatch to the Chicago Record. The automobile





## The Diamond Rubber Co.——

with every facility for manufacture, has been both conservative and progressive in placing its vehicle tires on the market—conservative in offering nothing that has not stood the test of time and severe usage, and progressive in making such tests. The

### DIAMOND MOTOR TIRES

are the result of more than three years' experience and are thoroughly reliable. If you have not one already send for the latest catalogue of the celebrated Diamond Tires.



clubs and manufacturers are naturally preparing to oppose the campaign against automobiles; but a large section of the public approves the action of M. Rene Cavard, controller-general of the department of the interior, in ordering all the prefects of France to forbid the holding of such races until their purpose has been approved by the minister of the interior.

One hears on every side such statements as the following: "Automobiles either in the streets of Paris or the country roads have become a menace to life and property." But the matter has an economic side as well. The manufacture of automobiles has become one of the most important of French industries and such repressive measures are bound to have a bad effect on the trade.

The secretary of the Automobile Club here, a famous institution established to foster the manufacture of the new carriages, said today: "Such restrictions cannot last long. They are too unfair. If this crusade against the automobile lasts, it may be the prelude to suppressing that means of conveyance altogether.

"It cannot be denied that there is a great number of careless drivers. There is where the reform should start, and not by destroying entirely what is one of the most important inventions in the world and of great economic significance in France at present."

Every newspaper is full of suggestions for regulating the use of automobiles, but no one thinks that the prefect's decision can remain in force.

#### CARELESS AUTO SCORCHERS

As the automobile began its career in France, its fortunes in that country are in some measure prophetic, says the Chicago Tribune editorially. For this reason it is worth remarking that careless "scorching" in last week's race from Paris to Roubaix resulted in accidents so serious as to result in the forbidding of all automobile races in that prefecture except by special permit. This may prevent the holding of the Paris-Bordeaux and the International cup races, which have been planned in connection with the Paris Exposition. It is evident that the automobile is now passing through the

same stage as did the bicycle when heedless and reckless riding necessitated regulations for wheelmen. It is unfortunate that the careful man must have his liberties clipped because of the excesses of the reckless, but this will sooner or later have to be the case regarding automobiles in the United States as well as in France. Automobile manufacturers can do much toward avoiding stringent legislation by refusing to gear any machine to a greater maximum speed than twelve miles an hour.

#### KANSAS CITY RACES

The Kansas City Automobile Co. writes to the Motor Age as follows:

"Kansas City is preparing for a grand motor-vehicle race, to come off during the time of holding the national Democratic convention here. We have written a number of motor-vehicle manufacturers to this effect and asking to what extent they can furnish vehicles. We do not know of a time since the industry started when the chance for them to show off to the nation was greater. Thousands of people will take advantage of the low railroad rates to come and see the young giant city of the west.

"We will be thankful for communications offering suggestions and advice from every lover of motor-vehicles, from a motor-bicycle up. The scheme is to be all around, every day affair for amateurs, with regular every day vehicles. Will you spread the matter in your journal, so that we may be able to reach all manufacturers who will want to take an interest in what we hope to make the highest grade show ever made? The net proceeds will go to the fund for rebuilding our convention hall. Kansas city will put up the best she has to the end that everyone will be glad they came and took a hand."

#### BECONNAIS OBJECTS TO MUFFLERS

The French racer Beconnais has just written a long letter to the "Velo" protesting against the obligatory use of the muffler in racing. He says in part: "Considering the speed which we today attain, I find that the noise made by our machines becomes extremely useful. When

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Send drawings or blue prints showing what you want, and we will furnish an estimate on the job. All of our work is first-class.

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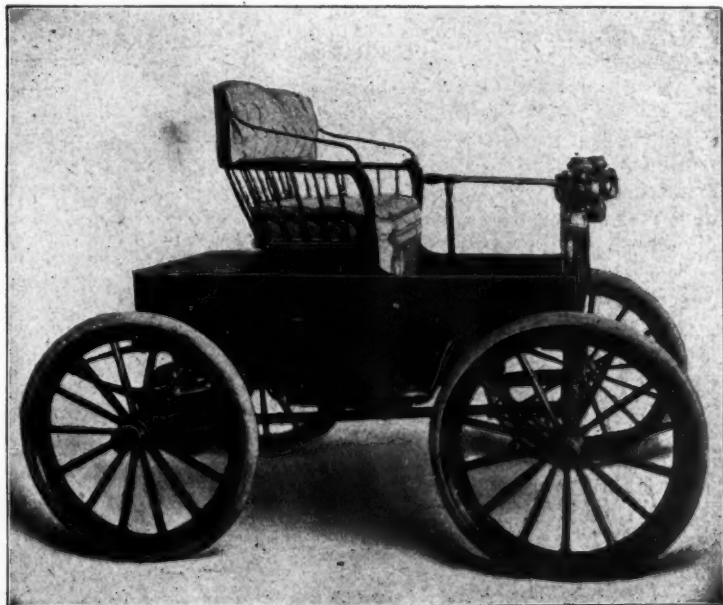
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Engine.  
Easily understood;  
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We also make the  
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**ELGIN  
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CHICAGO



INSIST ON  
**SOLAR AUTOMOBILE LAMPS**  
AS EQUIPMENT  
ON YOUR VEHICLE

BADGER BRASS MFG. CO. KENOSHA, WIS.

we pass by at a speed of seventy-five to eighty kilometers, do you think the ears of the good public will have time to be permanently injured? Since I have acquired the habit of going at this speed even the dogs fly out of the way. You know as well as I that we cannot stop in eight or ten meters like the big vehicles. We require at least fifty meters. The life of a man will certainly be in more danger from a vehicle that makes no noise.

"I ask the commission of the Automobile Club to leave us absolutely free if it wishes to see good sport. On the contrary, we will not complain. I am about to install thirteen mufflers on my tricycle. That, however, will not keep me from losing a third of the power and will place me in much more danger along the course."

L'Automobile Illustre, in commenting on the above letter, says: "Behold the effects of racing. The trumpet is not sufficient to clear away the earth; we must now do away with the silencer; we must have more noise, noise enough not only to make the natural users of the roads get out of way, but also to make the dogs flee for their lives. Beconnais also finds that his own life is not in such great danger. He calls this sport. We call it simply folly."

Henri Fournier will ride a tricycle in the Paris-Bordeaux race.

In their early races in Paris Elkes will use a gear of 118, Taylor 116 and Linton 120.

Fred Schinneer, the six-day rider, is negotiating for a motor tandem to use this season.

Austin Crooks, the motor cyclist, is now in the employ of Peter Berlo, who is making motor pacing machines.

The Autogo formerly used by the Beaumont Sisters on the stage has been sold to David C. Goodman, of 29 Wall street, New York. This machine is to be used on the stage at the Lexington Avenue Opera House by Professor A. Newberger.

Newark will make a specialty of motorcycle racing. The Vallsburg track is being strengthened greatly for the heavier work of the season. Motor cycle paced contests will also be run, but the motor races with a

limitation on the motors will be the strongest card.

The New Bedford cycle track is said to be one track in the country on which the motor tandems will be able to go at their full speed. The surface is rough and there is no danger of side slip.

The difficulties which are besetting the N. C. A. in placing a reasonable limit upon motors which will be operative, are many, and it is said that the limitation will be upon the size of the cylinders.

There will be a motor contest at the opening of the Fountain Ferry cycle track for \$150 first, \$100 second and \$75 third. This contest will be open to the world, and it is thought twenty teams will be entered.

There have been objections in Los Angeles to allowing professionals to pace amateurs. The custom has been sanctioned in the east for the past year by the board of control and will again be practiced this season.

Elkes, the American champion, believes that Tom Linton will win the opening races in Paris, as he will be first in condition. Bourotte has been going faster unpaced than any of the other riders in training in Paris, and with the fastest pace might show championship form in the early contest.

John Chapman, of Atlanta; John Lawson, Chicago; W. B. Vaughn, Los Angeles; Oscar Julius, Sweden, and Gus Lawson, Chicago, have taken up their residence for the early part of the present season at Salt Lake City. The party is supplied with four motor cycles, motor racing being very popular with the Mormons.

The motor team of Judge and Miller is most anxious to arrange a match race at an hour with the typhoon motor team, Henshaw and Hedstrom, for \$500 a side. Judge and Miller ride the machine which gained all the motor records last season and won a majority of the contests. This has now been fitted with a new motor and is capable of fifty miles in the hour. Hedstrom and Henshaw have a new machine which they say will travel fifty to sixty miles an hour with their assistance.

Archie McEachern and Bobbie Thompson, the Canadian cyclists, have secured their motor cycle from a Newark manufacturer and say that without a doubt they have the fastest machine upon the track. This machine is three horsepower and is guaranteed to go sixty-five miles to the hour on tracks that will stand it. McEachern will follow the machine, which will be manned by Bobbie Thompson and another rider to be se-



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There is no tubing manufactured that will meet the requirements for Automobile construction as will the Shelby Seamless Cold Drawn Tubing.

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For Automobile Builders

Any kind of special work to order. Automatic Screw  
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**HDW. CO.**

CLEVELAND, O., U. S. A.

lected. Thompson and McEachern will be together for motor tandem races.

Joe Judge will put out a motor team on his own account this season, Goodman and Dyer Judge will be up with Charlie Miller as was he last year when the team scooped everything.

The report somehow gained circulation that De Knyff in his wonderful ride at Pau France, when he did  $34\frac{1}{2}$  miles of the distance in  $33\frac{1}{2}$  minutes, used a tricycle. This was an error, as the machine used was a four-wheeled motor car.

A new track will be built in all probability at Reno, Nevada, and a circuit date will be asked for on the Western extension of the National Circuit next fall. Carson is another city where cycling interest is high and this celebrated town may also be in on the circuit.

Harry Caldwell wants to race the winner of the Ryan-Bolting match of April 19 at Fall River and has deposited \$50 with the cycling editor of the Boston Globe, John J. Donovan, to bind the match. Caldwell claims the championship of the year and stands ready to cover the money of any one.

Bobbie Walthour is working down in Birmingham, Ala., for the Birmingham Arms Co. Walthour is anxious to promote some spring races in that city, which has one of the best of the smaller outdoor tracks of America. It is eight laps to the mile and capable of 1:30 to the mile without danger.

The seating capacity is about 2,000 and the people have lots of money in these prosperous times and are interested in the game. A meet promoted by W. H. Pickens and Lee Richardson last fall brought a \$600 gate.

Rutz and Hausman, who gained an enviable name in the amateur ranks last season as handicap riders and amateur team workers, to the common good of the firm, will start for Louisville in all probability this week to prepare for the season. Rutz and Hausman will ride a motor, Rutz will enter paced races and both will be seen in the sprint contests.

Some of the motor pace followers of the season will have to change their style or drop out early. It is said that C. Stuart Bolting of Providence is a great little rider when in the lead, but that when headed, he loses heart. Joe Downey of Boston is much the same way, but has even been known to quit when in the lead. Both of these riders have speed and ability and without that "yellow streak" might be stars.

Out at Los Angeles they have experienced the beauties (?) of matching motor machines which were not equal in speed, and one motor ran away from the field again and again until the races were condemned by the papers. This winning motor was fitted with a carburettor which the others had not. These races demonstrated the advisability of placing a strict limit upon the motors of some sort which will make the machines about equal, as is the case with the safety wheels of today, when the ability of the riders will count.



**AUTOMOBILE RIMS**  
ALL SIZES. PROMPT DELIVERIES  
**DRAKE MFG. CO.**  
MILWAUKEE, WIS.

## For Motor Vehicles

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We are prepared to make all kinds of

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FOR **AUTOMOBILES** AND **MOTOR BICYCLES**

**REED & CURTIS MACHINE SCREW CO.**  
WORCESTER, MASS.

## Gasoline Engines!

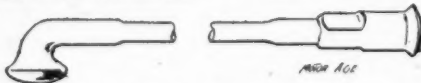
OPPOSED CYLINDERS,  
BALANCED TYPE.

Latest, Most Compact Design for Vehicles & Launches  
4 to 12 H. P. : Blue Prints, \$1.

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## SPOKES

We manufacture Spokes for Automobiles.



**EXCELSIOR NEEDLE CO., Torrington, Conn.**  
WESTERN OFFICE, 40 DEARBORN ST., CHICAGO

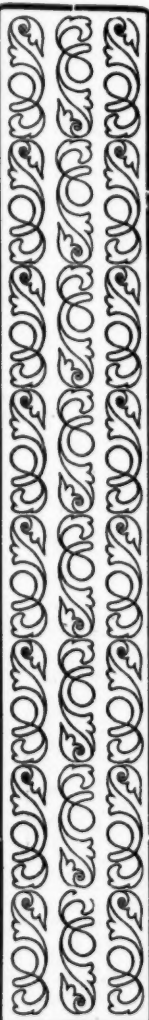
## AUTOMOBILE WOOD RIMS!

28-inch to 36-inch for 2 inch to 4-inch Tires

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# CATALOGUES

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The advantage of having this class of work done by men who not only know the craft of printing and advertising but who are versed in the technicalities of the motor-vehicle business, is apparent. ❁ ❁ ❁ ❁ ❁ ❁ ❁ ❁

To say the right thing in the right way is the secret of successful advertising. ❁ ❁ ❁ ❁

This the Motor Age can do for you.

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Correspondence solicited. ❁ ❁ ❁ ❁

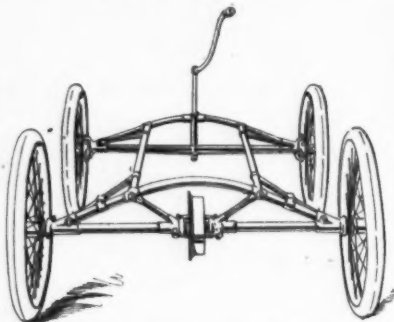
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Save time, experiment, expense and trouble by buying ours complete.



They are ready for enameling and wheels and will take any carriage body with springs, motor, tanks, etc.

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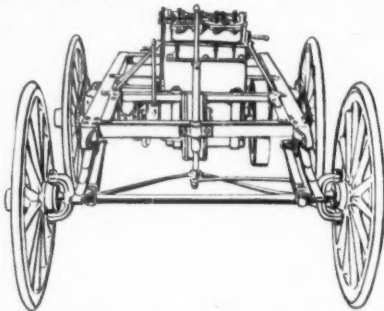
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## RUNNING GEAR COMPLETE

With wheels, solid or pneumatic tires, transmission gear, giving two speeds forward and reverse, and our 4½-horsepower, four-cylinder, shifting spark, gasoline motor, having variable speed from 100 to 1,500 revolutions a minute. The addition of a body, gasoline and water tanks, upholstery and paint makes it a complete vehicle capable of going anywhere and at any speed up to thirty miles an hour. Read complete description in Motor Age of April 12, 1900.



Send for catalogue of the best motor in any country, made in various sizes and number of cylinders, upright and horizontal, with fuller particulars of running gear.

**BUFFALO GASOLINE MOTOR CO.**

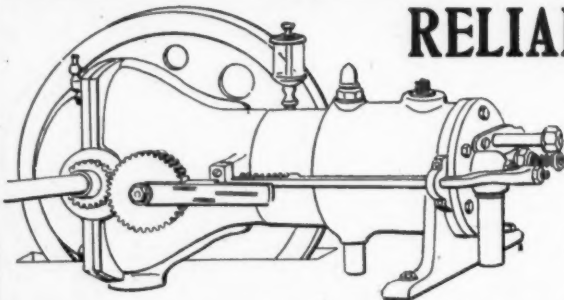
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